

Claims

1. A method of manufacturing a fibre-reinforced blade for a wind energy plant, said blade being configured with at least a blade shell and means for conducting to earth adapted for conducting a lightning current to an earth connection, wherein the method comprises that the blade is provided with segmented conductor means that are configured for conducting a lightning current outside the blade to the means for conducting current to earth; and wherein the method is **characterised in** that the conductor means are distributed and secured at the external surface of the blade shell in such a manner that the conductor means are essentially flush with the external surface of the blade shell.
2. A method according to claim 1, **characterised in** comprising the steps:
 - 15 a) arrangement of segmented conductor means on a mould;
 - b) laying of fibres on the mould, including on top of the conductor means;
 - c) attachment of the fibres and the conductor means by resin.
- 20 3. A method according to claim 2, **characterised in** comprising application of a substance onto the mould, including gel-coat, resin, primer or release agent.
- 25 4. A method according to one or more of claims 1-3, **characterised in** comprising sanding or polishing of the blade for exposing the conductor means.
- 30 5. A method according to one or more of claims 1-4, **characterised in** that the conductor means are arranged in a pre-manufactured band made of an electrically non-conductive material, including of a thermoplastic material.

6. A method according to one or more of claims 1-4, **characterised in** that the conductor means are arranged in an elongate bag-like band, said band being configured to be penetrated, including by resin and/or gel-coat.

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7. A method according to one or more of claims 2-6, **characterised in** comprising that the segmented conductor means and/or the band are, prior to step b), during moulding, fixated to the mould by adhesive means, including double-adhesive tape.

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8. A method according to one or more of claims 1-7, **characterised in** that the conductor means are electrically conductive particles that have an expanse of between 0.05 and 10 mm, including preferably between 1 and 8 mm.

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9. A method according to one or more of claims 2-8, **characterised in** comprising arrangement of at least one masking on the mould, following which a mixture of a polymer material, including gel-coat, and electrically conductive particles are applied in the masking.

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10. A method according to claim 8 or 9, **characterised in** that the electrically conductive particles are mixed with electrically non-conductive particles, eg ceramic particles, colour pigments, etc.

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11. A method according to one or more of claims 8-10, **characterised in** that the particles are flat and elongate with a length of between 2 and 10 mm and a transverse expanse of between 1 and 5 mm.

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12. A method according to one or more of claims 8-10, **characterised in** that the particles are flat and essentially circular with a length of between 2 and 10 mm and a thickness of between 0.1 and 1 mm.

13. A method according to one or more of claims 1-12, **characterised in** that the conductor means are metal shavings preferably made by planing, milling or turnery.

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14. A method according to claim 1, **characterised in** comprising that the blade shell is configured with a number of recesses, in which recesses the conductor means are secured.

10 15. A method according to one or more of claims 1-14, **characterised in** that the conductor means are distributed in at least one path, said path having a width of between 3 and 50 mm, including between 5 and 20 mm, including preferably between 8 and 12 mm.

15 16. A method according to claim 15, **characterised in** that the at least one path is arranged essentially transversally to the longitudinal direction of the blade and extends essentially from the fore edge of the blade to the aft edge of the blade.

20 17. A method according to claim 15, **characterised in** that the conductor means are distributed in at least one path which is arranged essentially transversally to the longitudinal direction of the blade, and spanning at least one main laminate in the blade shell, which main laminate comprises electrically conductive fibres.

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18. A method according to one or more of claims 1-7, **characterised in** that the conductor means are wires of metal laid out essentially in the same direction and distributed with predetermined spacings.

19. A method according to one or more of claims 1-18, **characterised in** that the conductor means are preferably made of metal, including brass, nickel, copper, brass coated with nickel or varnished copper.
- 5 20. A method according to one or more of claims 1-19, **characterised in** that the means for conducting to earth comprises at least one receptor arranged at the surface of the blade.
- 10 21. A method according to claim 20, **characterised in** that the receptor is arranged in a recess in the blade, said recess being essentially encircled by conductor means.
- 15 22. A blade for a wind energy plant, said blade comprising a fibre-reinforced blade shell and means for conducting to earth adapted for conducting a lightning current to an earth connection, wherein the blade is provided with segmented conductor means configured for conducting a lightning current outside the blade to the means for conducting to earth, and wherein the blade is **characterised in** that the conductor means are essentially distributed and secured at the external surface of the blade shell in such a manner that the conductor means are essentially flush with the external surface of the blade shell.
- 20 23. A blade according to claim 22, **characterised in** that the conductor means are arranged in a number of paths that extend from a receptor arranged at the surface of the blade, said receptor being connected to the means for conducting to earth.
- 25 24. A blade according to claims 22 or 23, **characterised in** that the conductor means are secured in a recess at the surface of the blade shell.

25. A blade according to claim 22 or 23, **characterised in** that the conductor means are cast integrally with the surface of the blade shell.
26. A blade according to claim 25, **characterised in** that the conductor means comprise an essentially evenly distributed layer of metal shavings.